



AIMS

African Institute for
Mathematical Sciences

NEXT EINSTEIN INITIATIVE

September 2014

Network News



Note from the President & CEO

Celebrating a growing network for maths and science in Africa

It's always a pleasure to share news on the diverse and distinctive projects undertaken by the AIMS Global Network to advance development efforts.

In pursuit of our goal to open 15 Centres of Excellence in Africa by 2023, the AIMS Next Einstein Initiative recently signed a Memorandum of Understanding with the government of Tanzania to open its fifth Centre. The new AIMS centre is scheduled to open in October 2014 in the city of Arusha in the country's northern region, a temporary location while AIMS' permanent facility in Bagamoyo is being prepared. This expansion marks a period of exceptional economic growth in Tanzania, which has truly emerged as an economic leader in East Africa. As of 2012, its Gross National Product (GNP) totalled US \$72.39 billion, ranking the Tanzanian economy second only to that of Kenya (US \$74.68 billion).

AIMS continues its concerted efforts to promote its model and demonstrate the crucial role that Mathematical Sciences should play in the transformation of Africa. At Centre level, a number of technical workshops designed to address local development challenges were organised over the last semester, in collaboration with partner academic institutions. At institutional level, participation in regional and international conferences is enabling the AIMS Global Network to progressively position itself as a major scientific player, reinforcing its contributions and attracting new partners from a variety of sectors.

This international recognition will be enhanced at the Next Einstein Forum, a new initiative launched by AIMS in partnership with the Robert Bosch Stiftung. The Next Einstein Forum (NEF) will be a global forum for science that will bring together 500+ outstanding thinkers and leading stakeholders from around the world in Africa. The NEF will highlight breakthrough discoveries, showcase Africa's top young scientists, and catalyze scientific collaboration for human development. As we prepare to host the NEF in October 2015 in Senegal, I encourage our partners, colleagues and friends across the scientific community to spread the news about the NEF, and to let us know if you would like to participate in this exciting event that will help to transform Africa into a leading member of the global scientific community.

With the launch of the AIMS ARETÉ Junior Chairs programme, established through a grant from the Robert Bosch Stiftung, Dr. Antoine Tambue, a brilliant African scientist and an AIMS Alumni, has returned to Africa to become the programme's Chair of Junior Research. The Junior Chairs programme was designed to encourage African scientists currently working or

studying overseas to return to the continent to continue their academic career and contribute to Africa's growth through research and teaching.

The 2013/2014 academic year came to a successful close in July. On behalf of the entire AIMS family, I would like to congratulate the 171 students who successfully completed their year and earned a Master's in Mathematical Sciences. A series of graduation ceremonies took place across AIMS' centres to celebrate their achievements and to wish the new graduates the best of success in their future careers. I know we are not saying goodbye as we expect to stay in touch with all of our Alumni.

“On behalf of the entire AIMS family, I would like to congratulate the 171 students who successfully completed their year and earned a Master's in Mathematical Sciences.

I cannot conclude without mentioning the current health crisis in West Africa, which remains of growing concern for the AIMS Global Network. As a pan-African organisation, we are supporting the international community's efforts to stop the spread of the Ebola virus and ensure that all members of our staff and students are educated about the epidemic. We have established a surveillance team dedicated to coordinating and sharing essential information and procedures to prevent the transmission of the virus. We are working hard to safely bring all of our new students, including those from countries affected by the virus, to our centres for the coming academic year, which is starting now.

With that, I send a warm welcome to our 2014/2015 cohort of 190 students, including 59 women, from 31 countries to our Centres in South Africa, Sénégal, Ghana and Cameroon, and a special welcome to the additional 40 students who are preparing for their travel to Tanzania in October. I truly hope you will all enjoy your journey at AIMS.

Sincerely,
Thierry Zomahoun

Sharing the AIMS story around the world

Mr. Thierry Zomahoun, President & CEO of AIMS-NEI, led a team of representatives to key meetings across Africa and abroad to share the vision of the AIMS network and to promote Mathematical Sciences as a vehicle for the transformation of Africa.



Above: Thierry Zomahoun at the Montreal conference.
Below: AIMS-NEI delegation with the Hon. Ed Fast, Canadian Minister of International Trade.

Canada

At the invitation of the International Development Research Centre (IDRC), AIMS participated in a round table at the June 2014 Montreal conference on "Innovation in Africa: An Opportunity for Investment and Economic Development." The event was an opportunity for Mr. Zomahoun to present AIMS' mission and emphasise how its unique model equips students with skills for problem solving and critical thinking. Policy-makers, industry leaders and high net worth individuals attended the round table and offered to support this innovative initiative in African scientific training.

Cote d'Ivoire

Later in July, Mr. Zomahoun led a delegation from AIMS-NEI to take part in the Ministerial Conference on "Providing Africa's Youth with Skills and Training for Jobs" in Abidjan, Cote d'Ivoire. During a round table on this theme, Mr. Zomahoun delivered a powerful, challenging and engaging presentation. Calling African governments to invest in African youth, he emphasised that investment should not only be placed in Technical and Vocational



AIMS-NEI delegation at the Abidjan Ministerial conference.

Skills Development (TVSD), but should also prioritise the Mathematical Sciences. AIMS was highlighted as the working model for Africa in building the high level skills that talented young men and women need to lead and transform the continent.

Kenya

The Forum for African Women Educationalists (FAWE) invited AIMS-NEI to participate in its 9th General Assembly held from 13- 15 August in Nairobi, Kenya.



FAWE's team and partners.

As a key partner in FAWE's mandate to promote girls education in STEM in Africa, AIMS-NEI took part in a round table on "Nurturing Diverse Partnership for FAWE's Sustainability" to identify areas for future collaboration. A comprehensive partnership framework is being finalized and AIMS-NEI is excited about the opportunities to engage more girls in STEM through the partnership with FAWE.



Mrs. Massouka Bih (center) with Drs. Nuwagaba and Marijani.

AIMS-NEI was represented at the General Assembly by Mireille Massouka Bih, Director Africa Development Agenda, and Drs Savannah Nuwagaba and Theresia Marijani, both AIMS Alumni.

Germany

In July, the German Federal Ministry for Education and Research (BMBF) hosted a round table discussion at their Berlin headquarters with leading governmental stakeholders and some of Germany's largest foundations. The round table was convened to highlight AIMS' work, achievements and future objectives. The event was very well attended, with 10 institutions present from across Germany. Irene Tamajong, AIMS-NEI UK Director, and Arun Sharma, Managing Director of the Next Einstein Forum, represented the AIMS Network at the round table. ●



Irene Tamajong, AIMS-NEI UK Director (left), and Arun Sharma, Managing Director of the Next Einstein Forum (right).

AIMS-NEI VISION: Leading the transformation of Africa through innovative scientific training, technical advances and breakthrough discoveries that benefit the whole of society.

IN THIS ISSUE

1 Note from the President and CEO

2 Network News

3 Outreach

4 Research

5 Training Workshops

6 AIMS Industry Initiative

7 Alumni Alumni

8 Media Hits

AIMS-NEI Network News is produced quarterly by AIMS Next Einstein Initiative. Contact : info@nexteinstein.org

Ceremony in Dar es Salaam confirms AIMS-NEI's expansion to Tanzania

On 4 August 2014, the African Institute for Mathematical Sciences - Next Einstein Initiative (AIMS-NEI) signed a Memorandum of Understanding with the government of Tanzania to open the fifth AIMS centre of excellence.

The ceremony took place in Dar es Salaam at the offices of the Ministry of Education and Vocational Training (MoEVT). Prof. Sifuni Mchome, Permanent Secretary to the MoEVT, signed on behalf of the government of the United Republic of Tanzania, alongside Mr Thierry Zomahoun, President & CEO of AIMS-NEI.

The new AIMS centre is scheduled to open in October 2014 in the city of Arusha in the country's northern region. The permanent campus will reside at the Old Boma in Bagamoyo, a historical building donated by the government of Tanzania, and is set to open in September 2015, after extensive renovation work has been completed.

The expansion agreement was finalised following a meeting of top officials from the government of Tanzania and AIMS-NEI representatives in Toronto, Canada, at the **International Summit on Maternal, Newborn and Child Health** in May. Tanzania's President, His Excellency Jakaya Kikwete, co-chaired the summit with Canadian Prime Minister Stephen Harper.

According Prof. Mchome, Tanzania is to become a knowledge driven economy by 2025 and sees AIMS' newest centre of excellence in Tanzania as a



Signing the MOU with government of Tanzania officials, to open the fifth AIMS centre of excellence.

saviour at the right time. "Mathematics learning at Secondary and Primary level need to improve and with AIMS coming to Tanzania we are pleased. The vision of President Kikwete is to accelerate the development of Tanzania through the use of Science and Technology. This vision is alive."

Learn more about the expansion here:

<http://www.nexteinstein.org/next-einstein-initiative-to-expand-to-tanzania-following-signing-ceremony-in-dar-es-salaam> ●

Outreach

Teacher Training Workshops



Learning through technology and media

In collaboration with Pepperdine University, AIMS-NEI organised a workshop for local senior high school mathematics teachers from six schools in the central region. From 7-11 July, 21 participants comprising 13 men and 8 women were trained in the use of technology and media as tools for learning.



African Institute for Mathematical Sciences Schools Enrichment Centre (AIMSSEC)

The AIMSSEC July residential courses were hosted at Stellenbosch High School and attended by 97 teachers for the Mathematical Thinking 22 (MT22) course and 54 Year Two Advanced Certificate in Education (ACE) students, hailing from all parts of South Africa. The courses were delivered by six local lecturers from AIMSSEC, two local visiting lecturers and five international lecturers from the UK. Four local teaching assistants, all graduates from previous MT and ACE courses, and three additional teaching assistants, alumni of Warwick University and the Massachusetts Institute of Technology, supported the lecturers.

*Above: Teacher training workshop in Sénégal
Left: AIMS-Ghana Teacher training workshop.
Below Left: AIMSSEC July Residential Courses.*

Teaching mathematical sciences differently

In collaboration with the Ecole Normale Supérieure de Dakar, AIMS-Sénégal organised a teacher training workshop on innovative teaching techniques for mathematics and physical sciences from 4-8 August in Mbour. Entitled "Teaching mathematical sciences differently," the objective of this one-week workshop was to familiarize teachers with innovative teaching methods to engage and inspire their students. A total of 25 teachers, including 2 women, received training at the workshop. ●





Raising AIMS' Profile in the UK

Since opening in May 2014, one of the key focus areas of AIMS-NEI UK has been to raise the profile of AIMS in the UK through outreach activities.

The AIMS-NEI UK team will be delivering a presentation at the Cambridge-Africa seminar at King's College in December. The team will be joined by AIMS Alumni who will have an opportunity to engage in a Q&A with top academics.

This type of event provides a valuable opportunity to strengthen AIMS' links to Cambridge University, while also highlighting AIMS' role in transforming Africa through STEM. ●

TEDxAIMS

The second TEDxAIMS took place on 22 June, with the theme "Alone in a Crowd."

An audience of over 200 from the wider AIMS community gathered to enjoy stimulating talks, beautiful music and engaging conversation. The nine speakers came together from all over the world to exchange their ideas and stories. New York Times bestselling author Wendy Goldman Rohm shared a story entitled, "The Silent History of a Displaced Man", local musician Siya Ngcobo explained how he constructed his alter ego "Umlilo," and former AIMS student Savannah Nuwagaba explained how "oddness" took her from a Ugandan village to studying for a PhD at Stellenbosch University. Shani Judes, Marina Nash, Carolina



Odman-Govender, Kate Abney, Laura Santoni and Athenkosi Dyoli also spoke at the event.

Listen to the TEDx AIMS talks here:

https://www.youtube.com/results?search_query=tedxaims ●

Research

Bringing back Africa's own talent

One of Africa's brightest young minds, the mathematician and computer scientist **Dr. Antoine Tambue**, has returned to Africa to continue his research career.



Dr. Antoine Tambue

His return has been facilitated through the AIMS ARETÉ Junior Chairs programme, which provides high-profile and pioneering academic positions to young African scientists. The programme, a collaboration between AIMS-NEI and the Robert Bosch Stiftung (Germany), offers an opportunity for African scientists

currently studying or working overseas to return to the continent to continue their academic career and contribute to Africa's growth through research and teaching.

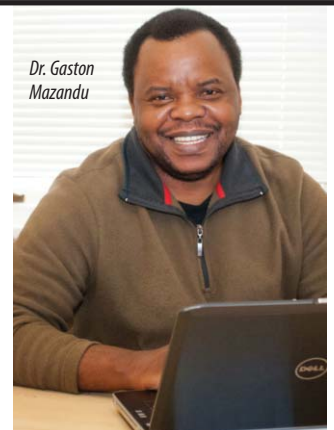
On accepting the inaugural **AIMS ARETÉ Junior Chair** position, Dr. Tambue said: "Being awarded with the ARETÉ Chair position to me feels like receiving the Fields Medal. This programme allows me to continue international-class research as well as help to build international recognition for research in Africa. I was not only awarded a long-term position at an AIMS Centre but also entered into a partnership with the University of Cape Town (South Africa) in a leading group (Centre for Computational Mechanics - CERECAM) in my field."

Mr. Zomahoun states that:

"These AIMS ARETÉ Chair positions are of highest importance and provide previously unthought-of opportunities for developing research capacity in Africa by strengthening the capacity and profile of top African scientists like Dr. Tambue and facilitating their return and integration into the academic environment in Africa."

Dr. Tambue will be based at the Research Centre at AIMS-South Africa in Muizenberg, Cape Town.

In May, Dr. Gaston Mazandu, a 2004 graduate of AIMS-South Africa and a specialist in Computational Biology and Bioinformatics, commenced his appointment as one of two IDRC-AIMS Career Development Research Chairs, and will split his time between AIMS-South Africa and AIMS-Ghana.



Dr. Gaston Mazandu

Made possible through funding from IDRC, the appointment marks a concerted effort to grow and strengthen the research programmes across the AIMS Network and to contribute to the research capacity building of AIMS Alumni. While based at AIMS-South Africa, Dr. Mazandu will spend approximately five months of the year at the AIMS-Ghana Research Centre while also identifying opportunities to help build research collaboration in Canada. Dr. Mazandu, from the Democratic Republic of Congo, will be joined by Dr. Wilfred Ndifon, a Cameroonian researcher with an interest in Quantitative Immunology and Bioinformatics. ●



Students gathered at AIMS-South Africa to prepare the IMO.

International Mathematical Olympiad Training Camp

Fifty-eight contestants from 12 African countries gathered at AIMS-South Africa for a final International Mathematical Olympiad Training Camp to prepare for the challenge of the International Mathematical Olympiad (IMO), hosted by the University of Cape Town on 8-9 July.

Fifty-eight contestants from 12 African countries gathered at AIMS-South Africa for a final International Mathematical Olympiad Training Camp to prepare for the challenge of the International Mathematical Olympiad (IMO), hosted by the University of Cape Town on 8-9 July.

The IMO is the world championship mathematics competition for youths under 20. The championship is hosted by a different country each year and requires contestants to solve six mathematical problems in nine hours.

"This is the first year in the history of the competition that so many African countries participated," said Prof. Johann Engelbrecht, Executive Director of the South African Mathematics Foundation (SAMF), the organisers of this year's IMO.

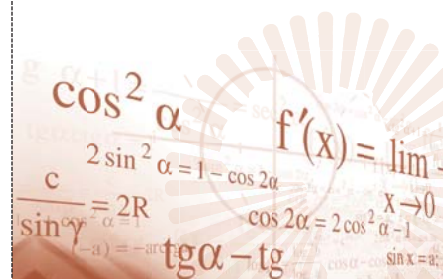
Prof. Barry Green, Director at AIMS-South Africa, explained, "At this training camp ahead of the IMO we provided an opportunity for the

contestants to sharpen their mathematical skills individually whilst being in a group environment." He asserted that activities like the IMO help identify, encourage and promote mathematical talent,

“This is the first year in the history of the competition that so many African countries participated,” said Prof. Johann Engelbrecht.

which is essential for the creation of new advances in computational science, big data, statistics and modelling that will catalyse growth and development.

The Department of Basic Education, Google, SABC Education, South African National Roads Agency Ltd. and Sasol were the main sponsors of the event. ●



Participants group photo.

Meaningful Modelling of Epidemiological Data

From 2-14 June, the South African Centre for Epidemiological Modelling and Analysis (SACEMA) held a two-week Clinic on the Meaningful Modelling of Epidemiological Data in collaboration with AIMS-South Africa.

The Clinic focussed on combining mathematical modelling ideas with practical approaches to infectious disease data and policy, and emphasized the use of data in understanding infectious disease dynamics. The event brought together graduate students, postdoctoral students, and researchers from North America and Africa, with the goal of engaging participants in epidemiological modelling projects using real data to grapple with practical questions. ●

AIMS Industry Workshop on entrepreneurship.



Building the entrepreneurial skills of scientists and engineers

AIMS-Ghana and the Institute of Physics (IOP), U.K, jointly organised the 2014 Entrepreneurship Workshop for Scientists and Engineers at the AIMS-Ghana campus, from 14 -18 July.

A total of 39 participants from four African countries, including nine women, took part in the workshop designed to build the entrepreneurial skills of scientists and engineers and accelerate the commercialisation of their inventions.

Sponsors of the workshop included AIMS-Ghana, the IOP, the American Physical Society, the International Centre for Theoretical Physics (ICTP), the Institute of Electrical and Electronic Engineers (IEEE), and the Optical Society (OSA). ●

AIMS-Cameroon students visit the Cameroon Development Corporation (CDC)

Pursuing internship and research opportunities

AIMS-Cameroon students, staff and tutors visited the Cameroon Development Corporation's (CDC) banana processing house and oil mill in Tiko and Idenau on 4 July. The objective of the visit was to seek a partnership between the corporation and AIMS-Cameroon in order to explore internship and research opportunities for AIMS students and Alumni.

The CDC is an Agro-Industrial Complex that grows, processes and markets tropical export crops. The processing of banana from the field to the final packaging was very

interesting to both the students and staff. The group had the opportunity to enjoy the beautiful views of the plantations and beaches and observe the process of converting palm nut fruits to palm oil.

AIMS-Cameroon hopes to carry out research programmes in collaboration with the CDC to solve some of the problems the corporation is facing, especially the challenge of maintaining records of statistical data to improve production. A number of students have expressed a strong interest in working in this field next year. ●



AIMS-Cameroon students visit CDC.

Courtesy call from Google Vice President & Head of Francophone Africa



AIMS-Sénégal team with Google delegation.



The Vice President of Google, Ms. Jena Troussers, and Google's Office Lead for Francophone Africa, Mr. Deme, visited AIMS-Sénégal on 10 July.

The Vice President was very impressed with the AIMS model and expressed her willingness to support the network's career development activities. Google is a key AIMS donor that awarded a grant of US \$2 million for the construction of AIMS centres in 2010. ●



Dr. Theresia Marijani

AIMS Alumna, 2006

"At AIMS I developed research skills and learned how mathematics and biology could be used to solve the problems that can be caused by diseases in society."

Dr. Theresia Marijani from Tanzania was born the fourth child in a family of five children. At primary school, her life totally changed when her father lost his job and her mother struggled to pay the children's school fees with the low salary she earned as a secretary.

During this period, Theresia caught malaria and was forced to miss some of her studies. It was at this point that she first dreamed of solving the problem of malaria and decided she would study science.

However, her dream seemed to die when there were no good biology teachers available. A motivational maths teacher at her school inspired her to switch to mathematics.

Years after making this important decision, Theresia went on to receive a government undergraduate fellowship and began a Bachelor of Science in Mathematics and Statistics.

While Theresia was in the middle of her studies, her mother retired and she could no longer consider a Master's or PhD as an option. Her priority became to find any career in science.

But at the end of her first year, a woman introduced her to the possibility of studying a Master's of Science abroad if she maintained a high Grade

Point Average (GPA). Theresia decided to pursue this route and worked hard at her first degree.

After finishing her final exams, she applied to AIMS-South Africa and secured a place. She describes the Centre as an opportunity that "rose up in my dreams." At AIMS-South Africa she developed research skills and learned how mathematics and biology could be used to solve the problems that can be caused by diseases in society.

Completing her studies at AIMS-South Africa in 2006, Theresia began to apply the knowledge and research skills she had gained to pursue her dream of fighting infectious diseases. She received her PhD in mathematical modelling in 2012 and is now lecturing at the University of Dar es Salaam while pursuing research on infectious diseases.

She loves to inspire young people to enjoy mathematics and currently supervises six Master's students in the modelling of infectious disease. Two of her students have graduated.

Offering a word of advice to future AIMS students, Theresia states: *"Our deepest fear is not that we are inadequate, our deepest fear is that we are powerful beyond measure."* ●



Dr. Savannah Nuwagaba

AIMS Alumna, 2011

"As a young mathematician, I believed that mathematics that does not meet society's needs is not mathematics. Therefore AIMS' dream of using Mathematical Sciences to meet the development challenges of Africa was what excited me to enrol for the postgraduate diploma at AIMS-South Africa."

Savannah is the firstborn child to a mother of five in Bushenyi, Uganda. Her mother is a primary school teacher while her father is a farmer. Regardless of their low income, they always believed in education.

As a young child in primary school, Savannah often believed that mathematics was the most relevant subject in school because she could apply almost everything she learnt to her daily life at home. For example, planning how much food to prepare for the family, or counting money when shopping. To her everything was mathematics. She therefore opted to study applied mathematics. While studying bio-mathematics, her lecturer told her about AIMS.

After her graduation from AIMS-South Africa in 2011, she proceeded to Stellenbosch University, where she completed her Master's degree and is currently pursuing her PhD in mathematics. Her Master's thesis involved looking at the architecture of antagonistic networks and examining how the different ecological network architectures influence the stability of ecological networks against perturbations. Her PhD research aims to understand eco-evolutionary dynamics of

food webs with the hope that her findings will inform the complexity-stability debate.

To those who think scientists are boring, Savannah welcomes anyone to a challenge in football and music. Regardless of her tight schedule, she finds time to sing in different choirs and to play football. AIMS encourages all-round self-discovery and not just science and mathematics. Besides her research, Savannah also enjoys inspiring young people, especially African girls, to love education. Savannah believes that the future of any woman, and hence of Africa, is dependent on education, because, "if you educate a woman, you will have educated a nation". She hopes to continue inspiring young Africans to engage in Science, Technology, Engineering and Mathematics (STEM) courses in order to help bring about the change that Africa needs. ●



Cameroon



Senegal



Ghana



South Africa

Graduation at AIMS

After ten months of intensive training, 171 students from 33 countries, including 53 women, received their Master's in Mathematical Sciences from AIMS centers in South Africa, Sénégal, Ghana and Cameroon. The graduation ceremonies took place during the months of June and July.

AIMS 2013-2014 Graduates – 33 countries

Centre	Sex		Total	Nationalities
	Female	Male		
Cameroon	12	24	36	12
Ghana	12	28	40	16
Sénégal	13	33	46	20
South Africa	16	33	49	20
TOTAL	53	118	171	33

Media Hits

The Economist

Science in Africa On the Rise

Scientific research in Africa is gathering momentum • Aug 9th 2014

EXERPT: AFRICA has a poor reputation for scientific innovation. But when South Africa jointly won a bid in 2012 to host the world's largest science project, for a radio telescope called the Square Kilometre Array (SKA), it hoped to foster a new image. "It's changing the way the world sees us, as somewhere for cutting-edge science and technology," says SKA's Bernie Fanaroff. "And also the way we see ourselves."

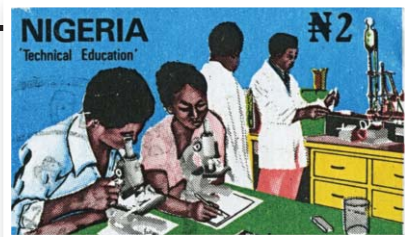
Tanzania: Mathematical Institute Opens Office in Tanzania

By Rose Athumani • allafrica.com • July 28, 2014

<http://allafrica.com/stories/201407280797.html>

SKA's satellite dishes will eventually span Australia, New Zealand and eight sub-Saharan countries. When complete, hopefully in around a decade, they could be the world's single largest source of data. That may in turn help host countries develop data-processing skills that will benefit them in other areas of "big data".

For the entire story, go to: <http://www.economist.com/news/middle-east-and-africa/2161112-scientific-research-africa-gathering-momentum-rise>



Government welcomes new science, maths university

By Malela Kassim • [IPPmedia.com](http://ippmedia.com) • August 4, 2014

<http://www.ippmedia.com/frontend/?l=70676.html>



Robert Bosch Stiftung

IDRC
International Development
Research Centre



CRDI
Centre de recherches pour le
développement international

